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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,995	10/29/2003	O-Hyun Beak	1349.1315	5309

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EXAMINER	
DO, AN H	

ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/694,995	BEAK, O-HYUN	
	Examiner	Art Unit	
	An H. Do	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The Amendment filed on 25 April 2006 has been acknowledged.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 8-17, 19, 22-30, 34-44 and 49-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Fasen et al (US 5,159,353).

Fasen et al disclose in Figures 1, 2 and 19 the following claimed features:

Regarding claims 1, 12, 25, 37, 44, 49, 52 and 53, an inkjet print head chip (Figure 1, substrate 16) usable in an inkjet print head (Figure 1), comprising:

-a semiconductor substrate (Figure 19, element 70);

-a plurality of MOSFETs (transistors 126) formed on the semiconductor substrate (70);

-first metal wiring layers (gate section 110) which apply a signal to the plurality of MOSFETs (transistors 126);

-a first insulation layer (124) formed on the metal wiring layers (gate section 110);

-a plurality of heaters (Figure 19, heaters 209) formed on the first insulation layer (124), and activated by the MOSFETs (transistors 126) to heat ink;

-second metal wiring layers (180, 181) formed in the first insulation layer (124) underneath the plurality of heaters (209), and externally radiate some of the heat generated by the plurality of heaters (209);

-a second insulation layer (passivation layers 222, 223) formed on the plurality of heaters (209) and preventing the plurality of heaters (209) from coming into contact with the ink; and

-a shock-blocking layer (262) formed on the second insulation layer (222, 223) which blocks shocks occurring when the bubbles resulting from the heated ink collapse.

Regarding claims 2-6, 13-17, 26-30 and 38-40, further comprising heat radiating parts (external lead 270) to which the metal wiring layers (180, 181) are connected (Figure 19).

Regarding claims 8 and 19, wherein the metal wiring layers (180, 181) are formed of one of aluminum (Al) and an aluminum alloy (column 10, lines 20-22).

Regarding claims 9, 22, 34 and 41, wherein the plural heaters (209) are provided in two adjacent linear arrays (Figure 2 shows two arrays of heaters 19).

Regarding claims 10, 11, 23, 24, 35, 36, 42, 43, 50 and 51, wherein the metal wiring layers (180, 181) absorb residual heat after the heaters (209) are deactivated to decrease an amount of the residual heat transferred to the ink and to decrease a time required for the plural heaters to return to a ready state (column 11, lines 7-15).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 20, 21, 32, 33 and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fasen et al (US 5,774,148) in view of Cornell et al (US 5,774,148).

Fasen et al disclose the claimed invention except for reciting the following claimed features:

Regarding claims 20 and 32, wherein the first insulation layer includes two layers, an upper layer on which the metal wiring layers are mounted is formed of SiO_2 and a lower layer is formed of BPSG.

Regarding claims 21 and 33, wherein the second insulation layer is formed of SiN.

Regarding claims 45 and 46, wherein the number of heat radiating parts and the number of the heating parts are the same as the number of metal wiring layers.

Regarding claim 47, further comprising a logic part which controls the heaters.

Regarding claim 48, further comprising an address part which transfers control signals from the logic part to one or more MOSFETs which control an electric current flowing to the heaters according to the control signals from the logic part.

Cornell et al teach the following claimed features:

Regarding claims 20 and 32, wherein the first insulation layer includes two layers, an upper layer (42) on which the metal wiring layers are mounted is formed of SiO_2 and a lower layer is formed of BPSG (39).

Regarding claims 21 and 33, wherein the second insulation layer is formed of SiN (column 5, lines 24-25).

Regarding claims 45 and 46, wherein the number of heat radiating parts and the number of the heating parts are the same as the number of metal wiring layers (Figure 3B).

Regarding claim 47, further comprising a logic part (column 1, lines 27-33) which controls the heaters (1).

Regarding claim 48, further comprising an address part (Figure 3A, address lines 23) which transfers control signals from the logic part to one or more MOSFETs (25) which control an electric current flowing to the heaters (1) according to the control signals from the logic part.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include multi-layered of insulation of certain material and control logic parts, as taught by Cornell et al into Fasen et al, so as to protect the heaters from damage and to control the operation of the heaters.

5. Claims 7, 18 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fasen et al (US 5,774,148) in view of Silverbrook et al (US 6,273,544).

Fasen et al disclose the claimed invention except for reciting the heaters are formed of TiN.

Silverbrook et al teach in Figure 54 that the heaters are being formed of TiN.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the heaters made of Tin, as taught by Silverbrook et al into

Fasen et al, for the purpose of obtaining low resistivity of the metal so not to cause problems with the bond pad resistance (column 11, lines 50-52).

Response to Arguments

6. Applicant's arguments filed 25 April 2006 have been fully considered but they are not persuasive. Applicant argued that Fasen failed to disclose metal wiring layers externally radiate some of the heat generated from the heaters. This is not found persuasive because Fasen does disclose the metal wiring layers (110, 180, 181) radiate some kind of heat since the layers are metal which absorbs heat generated from heaters (209).

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An H. Do whose telephone number is 571-272-2143. The examiner can normally be reached on Monday-Friday (Flexible).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AD
July 21, 2006

An H. Do
Primary Examiner
Art Unit 2853